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able 4.X – Goals and Objectives

Priority	Designated Uses	Goals	Priority	Pollutants and Impairments to Designated Uses (P) = Possible (K) = Known	Priority	Sources (P) = Possible (K) = Known	Causes	Objectives
	Partial and Total Body Contact Recreation	Restore and protect waterbodies for partial and total body contact		Pathogens (E. *coli*) (K)		Livestock (K)	Unlimited livestock access; lack of manure storage; runoff from land near drain or river	Exclude livestock from stream; follow manure application rates; work topical manure application into soil; construct waste storage systems; education of hobby farms with domestic animals
						Faulty onsite treatment systems (K)	Leaking, poorly maintained, failing, and over capacity septic systems	Determine location of failing systems; Develop a program to identify and replace failing systems; Identify districts where sanitary main extensions are possible; Encourage proper installation and maintenance of septic systems; educate public concerning septic treatment system maintenance
						Municipal wastewater (P)	Poorly maintained, leaking sanitary sewer systems	Repair/replace municipal wastewater system; minimize discharges and sanitary sewer overflows
						Storm Water Drainage Systems (P)	Anthropomorphic and natural sources	Continues IDEP program implementation in municipal areas; Perform IDEP screening during drain maintenance activities as "sewage" can be controlled in PA 40 (put in section); education of the public; use of vegetation.
						Wildlife (P) examples; water fowl, deer, raccoons, muskrats, other mammals	Overpopulation in open areas	Control water fowl and other mammal populations
						OTHER????		
				Sediment (Turbidity) (K)		Stream bank erosion (K)	Fluctuating hydrology	Stabilize drain flows to moderate hydrology; reduce suspended solids; prevent sediments from being transported out of drains into river; maintain the floodplain
						Urbanized area sheet and rill erosion when soils are exposed or sediment in runoff from impervious surfaces (K)	Urbanized sheet and rill erosion, exposed soils with no BMPs in place	Maintain pervious surfaces and encourage infiltration
						Channelization (P)	Straightening of waterways; channel improvements	Reduce suspended solids; implement low flow channel and vegetated shelves
						Livestock (K)	Unrestricted livestock access	Exclude livestock from drains/tribs; education of domestic animal owners
						Construction and development (K)	Lack of SESC practices and enforcement	Reduce suspended solids from construction sites
						Agricultural sheet. rill, and gully erosion (K)	Conventional tillage; plowing up to edge of drains or tribs at surface outlets, surface drainage of fields, lack of vegetated buffers, lack of flexibility of buffer programs	Encourage cover crops and reduced tillage; Implement programs to promote grassed waterways, variable width buffers, windbreaks; Education of hobby farm owners; Assist Farm Bureau with outreach programs
						OTHER??		
				Nutrients (K) (Algal Blooms)		Urbanized area practices (K)	Over-fertilization of lawns and vegetated properties; lack of riparian buffer; faulty on site treatment systems (K)	Establish vegetated filter strips or other riparian buffer; educate the public on proper disposal of yard waste; educate public on lawn care practices and fertilizing; encourage proper installation and maintenance of on site treatment systems; Continue implementation of a phosphorus ban on commercial lawn fertilizers; Implement Saginaw Bay Coastal Initiative Phosphorus recommendations for stormwater

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						Agricultural practices (K)	Over-fertilization of fields; lack of riparian buffer; livestock in streams	Identify livestock operations on drains/tribs; establish filter strips or other riparian buffer; increase canopy cover on drains/tribs; encourage reduced tillage practices; exclude livestock from drains/tribs; Determine if wildlife is source of problems in specific areas; Implement Saginaw Bay Coastal Initiative Phosphorus recommendations for agriculture
						Sediment Deposition areas (P)	Phosphorus and other nutrient recycling from sediment during anoxic conditions	Identify sediment deposition with high concentrations of nutrients; Research how to remove excessive sediment; implement actions to remove excessive nutrients
Priority	**Designated Uses**	**Goals**	**Priority**	**Pollutants and Impairments to Designated Uses**	**Priority**	**Sources**	**Causes**	**Objectives**
	Partial and Total Body Contact Recreation	Restore and protect waterbodies for partial and total body contact		Pesticides (s)		Urbanized Area practices (P)	Improper pesticide application and no calibration; impervious surface runoff from improper application	Installing riparian buffers such as filter strips; grassed waterways; Education on proper use; Assure applicators are properly trained
						Agricultural practices (P)	Improper pesticide application and calibration; leaching; runoff	Increase of farms using Integrated Pest Management; installing riparian buffers such as filter strips; grassed waterways; Education of hobby farm owners; Use of professional ag applicators from Co-ops and elevators
						OTHER?		
	Other Indigenous Aquatic Life and Wildlife	Restore and protect waterbodies for indigenous aquatic life and other wildlife		Loss of Habitat (K) (Wetlands and Fragmentation)		Creation of private ag drains / county drain maintenance (P)	Channelization to drain wetlands	Net gain of wetland acres; utilization of buffers
						Agricultural practices (K)	Wetlands drained for agriculture	Net gain of wetland acres; utilization of buffers; education of property owners
						Urbanized area expansion (K)	Wetlands filled for development	Net gain of wetland acres; utilization of buffers; education of property owners
				Nutrients (K)		Urbanized area practices	Over-fertilization of lawns, parks and other vegetated properties; lack of riparian buffer; faulty on site treatment systems	Continue implementation of a phosphorus ban on commercial lawn fertilizers; Establish filter strips or other riparian buffer; educate the public on proper disposal of yard waste; encourage proper installation and maintenance of on site treatment systems; Implement Saginaw Bay Coastal Initiative Phosphorus recommendations for stormwater
						Agricultural practices	Over-fertilization of fields; lack of riparian buffer; livestock in streams	Identify livestock operations adjacent to rivers; establish filter strips or other riparian buffer; increase canopy cover; reduce tillage; exclude livestock from stream; Implement Saginaw Bay Coastal Initiative Phosphorus recommendations for agriculture
				Pesticides (S)		Urbanized area practices	Improper pesticide application and no calibration; impervious surface runoff from improper application	Installing riparian buffers such as filter strips; grassed waterways; Education on proper use; Assure applicators are properly trained
						Agricultural practices	Improper pesticide application and calibration; leaching; runoff	Increase of farms using Integrated Pest Management; installing riparian buffers such as filter strips; grassed waterways; Education of hobby farm owners; Use of professional ag applicators from Co-ops and elevators
	Warm Water Fishery	Restore and protect water as warm water fishery		Water Depth (k) (Temperature)		Modified hydrology, drain modifications, naturally occurring	Re-directed stream flow; irrigation; low precipitation or low lake levels; lack of vegetative cover	Conduct hydrologic assessment prior to modifying drain hydrology or re-directing stream flow; increase tree canopy

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				Invasive Species vegetative (k)		Phragmites, Canary grass, purple loosestrife etc.	Introduced from various sources on the Great Lakes shoreline and have moved up the coastal regions of Lake Huron; have various transmission vectors but are establishing themselves	Minimize the spread of these species; education of landowners on eradication
Priority	**Designated Uses**	**Goals**	**Priority**	**Pollutants and Impairments to Designated Uses**	**Priority**	**Sources**	**Causes**	**Objectives**
	Warm Water Fishery	Restore and protect water as warm water fishery		Nutrients (K) (Low Dissolved Oxygen)		Urbanized area practices	Over-fertilization of lawns, parks and vegetated properties; lack of riparian buffer; faulty on site treatment systems	Establish filter strips or other riparian buffer and promote conservation easements; educate the public on proper disposal of yard waste and application of fertilizers; encourage proper installation and maintenance of on site treatment systems; implement sanitary sewer projects where population can support action.
						Agricultural practices	Over-fertilization of fields; lack of riparian buffer; livestock in streams	Establish filter strips or other riparian buffer; increase canopy cover; reduce tillage; install livestock exclusion fencing; education of hobby farm owners; support Farm Bureau programs; develop efficient incentive programs for compliance strategies when areas show non-attainment
				Loss of Habitat (K) (Aquatic habitat)		Creation of new drains or implementing drain maintenance	Scouring of the stream bottom for drain maintenance removes stable natural habitat	Establish low flow channels and shelves when applicable; establish filter strips; build and restore banks to reduce sedimentation
						Urbanized area expansion	Influx of people building next to surface waterbodies and drainage systems and removing riparian canopy and undergrowth	Install filter strips; establish forest or other appropriate vegetated buffers to increase shade canopy; education on riparian responsibilities and effects of practices on watercourses.
						Agricultural practices	Plowing up to edge of drains or tribs at surface outlets, surface drainage of fields, lack of vegetated buffers, lack of flexibility of buffer programs	Implement innovative buffer programs with incentives and concentration on surface outlets; Implement Farm Bureau programs; Education of hobby and non-attainment farm owners
				Removal/Lack of Food Sources (K)		Sediment loading	Erosion	Stabilize stream banks to reduce sedimentation; establish filter strips and vegetated surface outlets, improve programs for vegetated channels for stormwater conveyance
						Minnow harvest	Unlicensed harvesters	Increased oversight and enforcement on harvesting volumes and frequencies
						Nutrients	Over-fertilization of urban green areas or ag fields; lack of vegetated buffer	Establish filter strips establish forest or other appropriate vegetated buffers to increase shade canopy; education on riparian responsibilities and effects of practices on watercourses; implement surface outlet BMPs to decrease sediment loading in drains; Implement Saginaw Bay Coastal Initiative Phosphorus recommendations for agriculture and stormwater
						Pesticide loading	Improper pesticide application and calibration; leaching; runoff	Increase of farms using Integrated Pest Management or using ag applicators from local co-op or elevators; installing riparian buffers such as filter strips; grassed waterways; Education of urbanized area residents on proper applications.

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	Navigation	Restore and protect waterbodies for navigation		Trash and Debris (K)		Log jams/snags in lower reach	High flow events; Ice jams and blockages that move or create debris; stream bank erosion	Manage woody debris; stabilize stream banks; Continued managed clean up of Main Branch after major events (ice or water) or annual clean-up
						Petroleum Pipe river-crossings	Old petroleum pipeline crossings over the river;	Remove pipe crossings that are in navigable waters to prevent hydrocarbon spills
						Lack of maintenance	No designated entities responsible for removing obstructions and maintaining navigable waters; depositional areas in the river create nutrient deposits	Continue to manage debris; continues volunteer stream clean-up activities
						Dumping	General misunderstanding of how humans negatively impact the watershed by discarding trash; lack of signs or threat of enforcement	Hold an Annual River Clean-Up Day to remove trash from the river/streams/ditches; increase visibility of "No Dumping" signs; Education of county on detrimental effects of dumping in drains, tribs or river.
Priority	**Designated Uses**	**Goals**	**Priority**	**Pollutants and Impairments to Designated Uses**	**Priority**	**Sources**	**Causes**	**Objectives**
	Navigation	Restore and protect waterbodies for navigation		Water Depth (K)		Modified Great Lake's hydrology; drain modifications; naturally occurring	Re-directed stream flow; irrigation; low precipitation or (high / low) lake levels	Conduct hydrologic assessment prior to modifying drain hydrology or re-directing stream flow; Determine if a project can increase baseflow.
				Sediment (K)		Wake action in Main Branch (K)	Fluctuating hydrology, wake action caused by boat traffic and naturally occurring	Minimal speed for boat traffic to reduce re-suspending solids and stirring up nutrients
						Stream bank erosion	Fluctuating hydrology (k)	Stabilize stream flows to moderate hydrology, reduce suspended solids and maintain the floodplain
						Agricultural sheet, gully and rill erosion	Conventional tillage, plowing up to edge of stream (s)	Encourage cover crops and reduced tillage, as well as grassed waterways and windbreaks
						Channelization (P)	Straightening of waterways; channel improvements	Reduce suspended solids; implement low flow channel and vegetated shelves
						Livestock (K)	Unrestricted livestock access	Exclude livestock from drains/tribs; education of domestic animal owners
						Construction and development (K)	Lack of SESC practices and enforcement actions	Reduce suspended solids from construction sites; Utilize appropriate BMPs, Develop a civil infraction enforcement ability for SESC compliance
				Obstructions (k)		Dumping	General misunderstanding of how humans negatively impact the watershed by discarding trash; lack of signs or threat of enforcement	Hold an Annual River Clean-Up Day to remove trash from the rivers/streams/ditches; increase visibility of "No Dumping" signs; Education of county on detrimental effects of dumping in drains, tribs or river.
				Access Sites (k)		Limited places to enter the upper reaches of the river	Much of the area is private property; not many access sites to the river	MDNRE develop access sites on conservation easements; connect a water trail to the Mouth of Kawkawlin; Implement Visions of Green as a connection

(K) = known
(P) = possible